

Tilburg University

Panentheism and Natural Science: A Good Match?

Drees, W.B.

Published in:
Zygon: Journal of Religion and Science

DOI:
[10.1111/zygo.12377](https://doi.org/10.1111/zygo.12377)

Publication date:
2017

Document Version
Publisher's PDF, also known as Version of record

[Link to publication in Tilburg University Research Portal](#)

Citation for published version (APA):
Drees, W. B. (2017). Panentheism and Natural Science: A Good Match? *Zygon: Journal of Religion and Science*, 52(4), 1060-1079. <https://doi.org/10.1111/zygo.12377>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal


Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

The Many Faces of Panentheism

with Harald Atmanspacher and Hartmut von Sass, “The Many Faces of Panentheism: An Editorial Introduction”; Philip Clayton, “How Radically Can God Be Reconceived before Ceasing to Be God? The Four Faces of Panentheism”; Willem B. Drees, “Panentheism and Natural Science: A Good Match?”; Jan-Olav Henriksen, “The Experience of God and the World: Christianity’s Reasons for Considering Panentheism a Viable Option”; Roderick Main, “Panentheism and the Undoing of Disenchantment”; and Michael Silberstein, “Panentheism, Neutral Monism, and Advaita Vedanta.”

PANENTHEISM AND NATURAL SCIENCE: A GOOD MATCH?

by Willem B. Drees 

Abstract. Is panentheism a metaphysical and religious understanding of the divine and of the world that aligns better with science than classical theism? In order to address this question, I’ll present brief descriptions of theism, pantheism, and panentheism, and of religious visions as integrating models of the world and models for the world. In this respect, science has its limitations. The conclusion that I will argue for is that naturalistic varieties of theism, pantheism, and panentheism do equally well with respect to the natural sciences, and hence that there is no argument *from science* that favors a panentheistic metaphysics. There may be philosophical or religious arguments that make one prefer one position over another. Science can be involved in the choice for one *interpretation* of a religious-metaphysical view such as panentheism. Thus, science might play a role in the development of positions, once chosen, and hence in intra-religious competition, even though it cannot be decisive on fundamental choices in metaphysics.

Keywords: agnosticism; limits of science; naturalism; panentheism; science; theism

Does “panentheism” reinforce the dialogue between science and religion? Any answer depends on one’s understanding of “science,” of “religion,” and of the aim of “the dialogue.” We’ll get to those topics below, but first, we need to offer a provisional understanding of “panentheism”—a position with many faces, according to the title of the symposium at the Collegium Helveticum in Zürich from which the contributions in this section are

Willem B. Drees is Dean of the Tilburg School of Humanities and Professor of Philosophy of the Humanities at Tilburg University, the Netherlands. He also serves as the editor of *Zygon: Journal of Religion and Science*. He can be reached at w.b.drees@tilburguniversity.edu.

[*Zygon*, vol. 52, no. 4 (December 2017)]

www.zygonjournal.org

© 2017 The Authors. *Zygon*® published by Wiley Periodicals, Inc. on behalf of Institute on Religion in an Age of Science ISSN 0591-2385 **1060**
This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

drawn. Does panentheism reinforce “the dialogue between science and religion,” or rather their co-existence, and does it do so better than major alternatives such as theism and pantheism? Or does each of them face similar challenges when one tries to make a case on the basis of science, given the limitations of our natural sciences?

The first section will offer my articulation of theism, pantheism, and panentheism. The second section quotes some arguments by respected colleagues who see “panentheism” as an attractive option in “religion and science.” The evaluation begins in section three with a reflection on the nature of worldviews—such as panentheism—and the question when these could be considered “religious.” I will appropriate the definition of Clifford Geertz for this purpose. The fourth section offers a brief description of my understanding of natural science. The penultimate section considers the limitations of science, and claims that these are such that science cannot distinguish between a naturalistic theism, a naturalistic panentheism, or similar views. Though panentheism may be an interesting philosophical view, it is not one that is more favored by science (or less in conflict with science) than alternatives such as theism or pantheism. However, some interpretations of such a metaphysical-religious position may be more in line with science, and thus be preferable over other interpretations. Thus, the engagement with science is relevant in intra-religious competition rather than in the competition between grand metaphysical-religious schemes.

THEISM, PANTHEISM, AND PANENTHEISM: THREE GRAND SCHEMES

Terminologically, *pan-en-theism* seems to be a position that combines elements of pantheism and theism, by claiming that everything is ‘in’ God, though God transcends the world. Sometimes, it seems to mean that God is in everything, emphasizing divine immanence; “dependence goes both ways” (Henriksen 2017, 1081). Let me briefly characterize theism and pantheism before turning towards panentheism.

Theism

Theism can be defined as the position of those who believe in God. This does not help too much, unless one defines what kind of being a theist understands by ‘God.’ There are, of course, many approaches, but one prominent philosopher of religion, Richard Swinburne, may be taken as a fairly typical voice. The second sentence of the revised edition of his book *The Coherence of Theism* (1993, 1) comes to the point immediately:

By a “God” he [a theist] understands something like a “person without a body (i.e. a spirit) who is eternal, free, able to do anything, knows everything, is perfectly good, is the proper object of human worship and obedience, the creator and sustainer of the universe.”

Any of these characteristics can be disputed, but for the present contribution I want to emphasize a few elements as characteristic of most forms of theism.

- (a) God is *worthy of worship*. If one were to say of a king or a president that the person is worthy of respect, a value judgement is given. A value judgment is implied even more when we speak of “worthy of worship,” because “worship” far surpasses “respect.” Creatures are not to be worshipped. Upon a traditional Christian view, well supported by our experiences, we and other creatures are imperfect, and perhaps even sinful, “fallen,” and thus in need of redemption.
- (b) With the emphasis on perfection and all-encompassing knowledge, power, and goodness, God is taken to be the *Supreme Being*, the one who cannot be surpassed. I prefer the more cautious “negative” formula that we owe to Anselm (eleventh century), who in his *Proslogion* reflected upon God as “a being greater than which nothing can be thought.”
- (c) As creator and sustainer of the universe, there is a *categorical* distinction between God and everything else—the distinction between Creator and creatures. The Creator is the one to whom we all owe existence, and who is the ultimate judge of value.

Pantheism/Religious Naturalism

Pan-theism, etymologically a combination of the Greek term for “all.” *pan*, and “theism,” does without such a strong categorical distinction between Creator and creatures. Rather, “nature” is all there is. There is nothing else, nothing greater. However, as a religious position, it is not just a belief about existence, but also one about value. “Nature” has value. “Awe” and “wonder” might be terms that come easily to a pantheist, a deep appreciation and gratitude for nature and all that it has given us. A classic expression goes back to the seventeenth century philosopher Benedict Spinoza, ‘*deus sive natura*,’ speaking of reality as ‘God or nature.’

A more recent title that resonates with such a position is the one used by cell biologist Ursula Goodenough, *The Sacred Depths of Nature* (1998). She advocates a contemporary articulation of such a position, ‘religious naturalism’ (for her work and related voices see the website of the Religious Naturalist Association, <http://religious-naturalist-association.org/>, and studies such as those of Jerome Stone [2009] and Donald Crosby [2015]; see Drees 2006).

As religious naturalism and pantheism come in many varieties (as does theism), let me highlight a few motives.

- (a) Some “religious naturalists” seem to be driven by a dislike of the dualism implied in a categorical distinction between Creator and creatures; they prefer some form of philosophical monism.

- (b) By doing away with a transcendent or supernatural reality, the pantheist seems to avoid epistemological claims that go beyond the domain of experience. Thus, pantheism seems to align well with the empirical sciences.
- (c) Affective preferences may also be involved. “Immanence” is preferred over “transcendence”; nearness over distance. Rather than a supreme being “out there” who judges us—whether imagined as a Father or as Lord—it is Nature that “judges us,” because some ways of life are more effective and fertile than others; a line of thinking expressed by the founding editor of this journal, Ralph Burhoe, in an essay on “the Lord of History” (1975).

Panentheism

Now for pan-en-theism, here taken as distinct from theism and from pantheism or religious naturalism, though this label is used for variants of those positions as well. My teacher in philosophy of religion at Groningen University, H. G. Hubbeling, had written on Karl Barth and Emil Brunner, two major Protestant theologians in Europe in the middle of the twentieth century, on Spinoza, and on Charles Hartshorne and his logical reconstruction of the modal version of the ontological argument. He introduced me to the concept of panentheism.

Panentheism stands between pantheism and theism. Here the world is seen “in” God, but God still transcends the world. This concept is, however, not clear in every respect, because in theism also God is both transcendent and immanent, which would imply that the world is *in* God. Here one may think of Paul’s saying: ‘... for in him we live and move, in him we exist’ (Acts 17: 28). But insofar as panentheists say that the world has not been created by God but has emanated from him, and still maintain that God transcends the world, they certainly take a middle position between theism and pantheism. (Hubbeling 1987, 143)

Hubbeling points out the similarity of theism and panentheism. As he formulates it, the difference is in the distinction between *creation* and *emanation*, and with that in the question whether God and world are categorically distinct as Creator and creatures, or whether they are more alike, as the concept of emanation suggests. By shifting from “creation” to “emanation,” there is also a shift towards pantheism—the world as produced is similar in kind to the one who produced the world.

Hubbeling mentions one possible motive in favor of panentheism: “It is difficult to choose between theism and pantheism, and perhaps a middle system like panentheism should be preferred.” However, immediately thereafter, Hubbeling wrote: “On the whole, I prefer theism” (1987, 147). Thus, he himself does not opt for the middle, but points out that one of the attractions might be its position, as mediator between two major

options. I do not accept such a rhetorical argument—for then, by arranging options in such a way that the preferred outcome is in the middle, we could make the middle position more plausible. Thus, a question to be addressed in the next section is: *Why opt for panentheism?*

ATTRactions OF PANENTHEISM

There may be various good reasons to opt for a panentheistic view. The main question in the present article is whether such reasons have their basis in science, or whether these are philosophical or religious in kind.

In the context of ‘religion and science’ panentheism has been discussed and defended in *In Whom We Live and Move and Have Our Being: Panentheistic Reflections on God’s Presence in a Scientific World*, a volume edited by Philip Clayton and Arthur Peacocke (2004). The main title derives from a statement attributed to the apostle Paul when he visits Athens and encounters an altar for an unknown God—claiming that he, as a follower of Jesus Christ, now comes to inform the people of Athens on God who, unknown to them, they already worshipped, the only true God. Within that context in the biblical book of *Acts of the Apostles*, God is described as the one in whom we live, move and have our being (Acts 17: 28), a line also quoted by Hubbeling, above.

In the introductory essay Arthur Peacocke described a theistic position: God is external to the world and not influenced by the world. The emphasis on *impassibility* (aloof, not being influenced by) makes it hard to articulate a coherent understanding of God’s involvement in the world—especially if that world is understood as guided by natural laws.

The factors which have together provoked the current revival of the term “panentheism” are in fact extremely significant for our understanding of God’s relation to the world, including humanity. Broadly they all point to the need to accentuate, in the light of contemporary knowledge of the world and of humanity, a much stronger sense than in the past of the immanence of God as in some sense “in” the world—without, for most authors, demeaning from or qualifying God’s ultimate transcendence, God’s ontological ultimate “otherness.” (Peacocke 2004a, xix)

Thus, Peacocke maintains key elements of the theistic stance, but alongside divine openness to the world (*passibility*) he stresses ‘immanence,’ God’s presence in the world, which the term *pan-en-theism* expresses in the reverse, the world’s inclusion in God. Peacocke points to some elements of science that seem to support such a religious orientation, such as coherence and lawfulness (thus, no supernatural interventions) and the dynamic character of reality, in which complex phenomena ‘emerge’ out of more elementary processes and constituents.

- (1) The “seamless character of the web” implies that “at no point do modern natural scientists have to invoke any non-natural causes to

explain their observations and their inferences about the past. This intelligible and all-pervasive continuity . . . has rendered it increasingly problematic to conceive of God's action in the world as intervening in any way that involves an abrogation of the very regularities with which God's own self is regarded, by theists, as having endowed the world" (Peacocke 2004a, xx) Hence, no 'interventions' that suspend the laws of nature, and thus no miracles, if these are understood as interventions.

- (2) "Moreover, the past and present processes of the natural world are characterized by 'emergence,' for there appear in the course of time new forms of matter, often articulated in a hierarchical manner. . . . New kinds of realities come into existence, often by a process of *self-organization* of natural systems in ways explicable by the relevant sciences. This has provoked a renewed emphasis on the *immanence* of God as creator 'in, with, and under' the creative, natural processes of the world unveiled by the sciences" (Peacocke 2004a, xx) In this context, one might speak of ontological emergence, as new entities emerge. There is creativity in reality. Peacocke adds, however, that the processes by which entities these emerge may be scientifically intelligible.
- (3) "Furthermore, the entirely justified abandonment by philosophers and cognitive scientists of any dualistic account of human nature—in the past usually in terms of mind/body or mind/brain—has inevitably reflected upon the use of traditional models of God's relation to the world in terms of personal agency." Thus, as Peacocke sees it, the only ontological dualism that seems to be theologically supportable is simply "the distinction between the ultimate ontology of God and that of everything else, the 'creation'" (Peacocke 2004a, xxi). Given the description in the previous section, with this distinction Peacocke remains at the theistic end of the spectrum.

Later, in his own contribution in the volume, Peacocke describes the modern scientific picture of the world. He then makes the transition to theology: "Clearly the deistic conception of a God external to nature—dwelling in an entirely different kind of space and being of a 'substance' sufficiently different that it could not be involved continuously in the created order—does not cohere with these new insights into the world and its processes" (Peacocke 2004b, 143). God must be envisaged as involved in creative processes in the world, the processes through which life evolves and complex new realities emerge.

In his contribution to the same volume, "Panentheism in Metaphysical and Scientific Perspective," Philip Clayton offers a variety of reasons for panentheism. Among those, the second one points to science: "One might

be convinced that panentheism is more compatible than traditional theism with particular results in physics or biology, or with common features shared across the scientific disciplines, such as the structure of emergence” (Clayton 2004, 73). Other motives he lists include a rejection of classical theism combined with a dislike of atheism, a belief in the truth of a particular metaphysical position (process philosophy, German idealism) being able to preserve better particular religious beliefs (e.g. about divine action); the desire to have a position that mediates between Western and Eastern religious philosophical systems; a position that might be religiously more viable (e.g. not burdened with the problem of evil); and one that has preferable ethical or political implications (e.g. with respect to ecological responsibility) (73–74). However, he thinks the most prominent thinkers turn to panentheism because it seems to do a better job for making sense of God-language. Besides, “a panentheistic understanding of the God-world relationship is able to make connections with other academic fields” (74).

Clayton’s own arguments focus on the metaphysics of the subject and on emergence as developed in contemporary philosophy of science (Clayton 2004, 75). The whole is more than the parts. “Numerous scientific examples can be given: superconductivity . . . ; thermodynamical properties . . . ; chemical properties . . . ; the life of cell functioning . . . ; organisms . . . ; and a number of animals (especially the higher primates) manifest qualities of inner experience that emerge from but are not reducible to, the complexities of their central nervous systems” (85–86). Each of these phenomena needs its own conceptualization, its own approach, though they arise out of particular configurations of “lower level” entities. One might speak of “epistemic” emergence. On this basis, Clayton makes a shift to theology:

My thesis is simple: emergence provides the best available means, for those who take science seriously, to rethink (i.e., establish a new conceptual basis for) the immanence of God. (87)

There are various others who have written on panentheism. In a recent volume on *Alternative Concepts of God: Essays on the Metaphysics of the Divine* (Buckareff and Nagasawa 2016), the emphasis is more on philosophy of religion than on the natural sciences. Yujin Nagasawa argues for “modal panentheism”: God is the totality of all possible worlds, and all possible worlds exist to the same extent that the actual world exists (2016, 12). And John Bishop and Ken Perszyk propose “euteleological panentheism” (2016, 119–25). The problem of evil is especially strong for a theistic conception—where God is omnipotent, omniscient, as well as perfectly good. As Bishop and Perszyk see it, this should be a reason to qualify the conception of the divine. On their euteleological conception, “the divine may be identified, not just with Love as the supreme good which is the ultimate *telos* of all that exists, but, at the same time, with reality at its most

profound or ultimate—that is to say, with reality as inherently directed upon the supreme good, and actually existing only because that end is fulfilled” (121).

These provide an all too brief sample of panentheistic voices. Clearly, there is fundamental *philosophical* discourse on panentheism; for example, on teleology (Bishop and Perszyk) and modality (Nagasawa). And in discussions on panentheism one also finds references to emergence as a *scientific* way of understanding the rise of complex phenomena in the natural world (Peacocke, Clayton), whether ontological (new entities) and/or epistemic (new explanatory approaches). However, for someone who does not share the interest in such a religious-metaphysical position, it might be unclear why those scientific insights by themselves are considered religiously relevant. But before turning to science, let us *consider under what conditions a philosophical position such as panentheism could be considered religious*—which is the topic of the next section, a brief reflection on a way of understanding religions as worldviews with value-dimensions.

RELIGION: ETHOS AND WORLDVIEW

Are theism, pantheism, and panentheism religious positions, or merely philosophical, metaphysical ones? To reflect upon this, we need to pay attention to the concept of “religion.” For our purpose here, I want to make use of the definition of the anthropologist Clifford Geertz (1966, 4; 1973, 90):

A religion is (1) a system of symbols which acts to (2) establish powerful moods and motivations in men by (3) formulating conceptions of a general order of existence and (4) clothing these conceptions with such an aura of factuality that (5) the moods and motivations seem uniquely realistic.

A page earlier, he wondered what religious symbols (and texts and rituals) do:

Sacred symbols function to synthesize a people’s ethos—the tone, character, and quality of their life, the aesthetic style and mood—and their world view—the picture they have of the way things in sheer actuality are, their most comprehensive ideas of order. (1966, 3; 1973, 89)

The combination of worldview, “conceptions of a general order of existence,” and ethos, “moods and motivations,” has been expressed also as the combination of models *of* the world and models *for* the world. Thus, if a believer praises God as Creator of heaven and earth, not only does the theist endorse a particular model *of* the world—“God not part of the world, made the world. At the same time, the theist expresses attitudes, or at least implies them; perhaps those of gratitude and awe, as well as modesty and responsibility, to take care of God’s gift.

The engagement with science most directly regards the “models *of* the world.” Observations and experiments support empirical theories, and those theories may be incorporated in a larger framework, say the standard scientific understanding of the world. That could be the input into a worldview, sometimes also called a “cosmology.” My understanding is that this is a hypothetical-deductive “way up.” from empirical observations to theories to more encompassing theories, and in that process, there is creativity involved. There is underdetermination—the higher is a theory that is consistent with the observations, but it need not be the only such theory possible.

Similarly, moral intuitions feed into more encompassing moral systems, and thus, one might envisage a system of values, an axiology, as the parallel to a worldview, but now for models *for* the world. Philosophically speaking, those two lines of reflection and research—the one moving up to an encompassing worldview, the other to an encompassing moral vision—are distinct. Though in the complexities of daily life judgments of value and of facts are not always distinguished well, we have learned to consider these different kinds of judgments. Conflating the two has been called “the naturalistic fallacy,” especially when one moves from descriptive to prescriptive statements, from “is” to “ought.”

If we take the definition of Geertz for guidance, in a religious view both lines of reflection come together and are intertwined. For a philosophical view rooted in science, a worldview, to be a religious (or non-religious) view of life, it has to have a moral and aesthetic message, and to relate these to an understanding of reality, of the way things are taken to be, so that those values are “realistic” (see for a more extensive appropriation of Geertz for “religion and science.” Drees 2010, 76–82, 136–39).

The considerations in favor of panentheism given above do indicate such a combination, by valuing the dynamics of life and hence of the emergence of complexity, as Peacocke and Clayton do, and by reflecting upon the problem of evil, as in the contribution by Bishop and Perszyk. Is such a rich panentheism, loaded with symbols that synthesize ethos and worldview, supported by the natural sciences? To address this question, we will turn to a brief reflection upon the natural sciences.

DELIVERIES OF SCIENCE

Before returning to panentheism and its alternatives in relation to science, I want to reflect briefly on some characteristics of contemporary science.

Multiple Levels of Description

The natural sciences articulate knowledge about reality, for instance about matter, substances, stuff. A classic example, present in almost all chemistry labs in secondary schools, is the periodic table of the elements, which

begins with hydrogen and helium, and orders the various chemical elements in rows and columns. This scheme embodies knowledge, mostly acquired in the nineteenth century, on substances and their constituents. At this level of description, we—or at least the chemists among us—seem to understand reality quite well. It is knowledge to which people of various countries and cultures have contributed, which allows chemists to study and create new substances. It is, heuristically and pragmatically, extraordinarily effective.

We also know why the table has the structure it has; for instance, why there are various similarities (e.g., between elements on different rows in the same column) and why there are that many elements on each row. This has to do with the structure of individual atoms, with a nucleus (protons, neutrons) surrounded by electrons, and the consequences of a description of such a system in terms of quantum physics. With such a description, we move into the territory of physics. Within physics, theories have been developed that probe more deeply, and describe protons and neutrons as consisting of sets of three “quarks,” held together by particles called “gluons.” This theory passes sophisticated empirical tests well, but it is farther removed from human experience than the knowledge presented in the periodic table. It is a level of knowledge that is not needed within chemistry when considering the efficacy of drugs in pharmaceutical contexts, but nonetheless genuine knowledge. What then are quarks? Some branches of physics dig further. Among the ideas proposed are theories that describe reality in terms of minute vibrating strings (string theory), but here we clearly have moved into rather provisional, speculative areas of science.

Similar “layers of understanding” arise at many places. Gravity was effectively described in 1687 by Isaac Newton in his *Philosophiae Naturalis Principia Mathematica*, as a force acting at a distance. This was an excellent theory that served very well to explain and predict movements on earth and in the heavens. However, it did not align well with a major success of the nineteenth century, James Clerk Maxwell’s equations that described electromagnetic radiation. Newton’s equations of motions were harmonized with electromagnetism (and the constant speed of light) in the early twentieth century with Albert Einstein’s special theory of relativity (1905). A further development, the general theory of relativity (1915), incorporated gravity by replacing the idea of gravity as a force working at a distance by the effect of curvature of space-time. For low velocities (relative to the velocity of light) and modest masses, Einstein’s general relativity theory would give the same results as Newton’s, which thus continues to be a very effective way of understanding movements in the world around us. But deeper down, it presents to us a different ontology, a different understanding of the way things are. And Einstein’s theory might not be the final answer yet either, as it is not in line with another extremely successful theory, quantum physics. Proposals for further developments in “quantum gravity” have been made (superstrings; most recently, a proposal on “emergent gravity” that draws

on quantum information and the holographic properties of surfaces of black holes, by Erik Verlinde 2016), but here we are clearly in an area where all current science is hypothetical and explorative rather than consolidated.

In this contribution, I intend to point out some of the characteristics of this multilayered understanding of science that this selective history might be taken to indicate.

- (1) There is *consolidated* science, such as embedded in the periodic table. Though all science is a human construction, this layer of understanding is so well established, confirmed by numerous experiments, and used effectively in a wide variety of practices, that at that level of description one should not dismiss such knowledge.
- (2) However, if one pushes further, there is the *current frontier* of science. Scientists disagree, theories and models may be proposed but not yet tested (and perhaps even not yet testable with current technologies). Some of these might become successful, and become consolidated science. Some might fail and be discarded, with honor. And some proposals might remain undecided.
- (3) Among those that are undecided, and beyond the boundary of well-defined scientific theories and models, one finds proposals that are rather hypothetical and speculative, at a distance from empirical testing and pragmatic use. Issues about emergent gravity and other proposals in quantum gravity should be considered as such, and ideas about multiple domains of the universe, so called “multiverses,” beyond our horizon.
- (4) And interpretations of well-established science, such as quantum physics, may remain speculative. There may be multiple interpretations of a single mathematical formalism, and those interpretations seem to be empirically equivalent.

It is in the realm of proposals (3) and of interpretations (4) that most of the metaphysically interesting issues are, such as questions about the nature of time, about ultimate origins, about determinism or indeterminism, and the like. But those domains are also most marked by a plurality of research programs, driven by different philosophical preferences.

Why Should We Respect Science?

Science is done by humans. It is the outcome of social processes. It is fallible, because people may cheat. Why then should we take the sciences seriously? Such a challenge became more prominent with Thomas Kuhn's book *The Structure of Scientific Revolutions* (1962), which considered major changes—so-called revolutions—changes in the ruling “paradigm.” The most prominent example was the shift from a geocentric understanding of

the universe to a heliocentric one, with Nicholas Copernicus and Galilei Galileo in the sixteenth and seventeenth centuries. If we have been wrong in the past, should we not assume that we can be mistaken today as well?

The history sketched above might allow for some differentiation. At a practical level, the transition from the geocentric to the heliocentric view did not undermine predictions, for example on solstices. And even if our understanding of substance “deep down” is likely to change, the knowledge embodied in the periodic table, that is, the knowledge used in chemistry, is likely to remain unaffected. Within a domain such as chemistry, we have made enormous progress since the early nineteenth century, not only with the periodic table but also in discovering the rich variety of materials that can be made with these elements. Just as the “flat earth” is no longer worthy of serious discussion, given all our knowledge of the earth, our experiences with weather satellites and intercontinental flights, and much more, so too a division of matter in just four or five categories, say fire, air, water and earth, is something of the past, at least at that level of description.

The Kuhnian challenge has triggered quite some work in the philosophy of science. One example of relevant work, in my opinion, is Philip Kitcher's *The Advancement of Science* (1993), which takes the social character of scientific research seriously, but argues that despite radical changes there is sufficient continuity in the whole complex of science—not just theories, but also questions, techniques and much else—that one can speak of progress. Thus, though current knowledge is not the final answer, it may be taken to be serious enough, especially when scientific insights make major advances at the theoretical level by unifying, expanding and correcting theories, and/or at the practical level, either because of applicability in a wide variety of domains (as chemistry) or as insights that once were new become so well established that they serve as tools in further research (e.g. using electrons in electron microscopy).

What Does Respecting Science Entail?

There are intellectual and moral reasons to respect science. By using the best available knowledge we can help people. Playing down established knowledge makes it easy to exploit vulnerable people. Experimental evidence that smoking causes cancer, not just among smokers but also among bystanders, made it possible to promote wiser policies. Of course, such steps are not always welcome. Thus, we find that science is played down in the interest of the tobacco industry, and more recently for the sake of those with an interest in fossil fuels. And, more driven by ideology than driven by economic interest, the opposition to evolution and to vaccination is also a context in which advocates of various positions play down science, including science that I would classify as “consolidated.” Each of those appeals to doubt and provisionality, some lavishly funded and legally

smart, as documented in *Merchants of Doubt* by Naomi Oreskes and Erik Conway (2010), plays down established science for the sake of nonscientific interests. In consequence, vulnerable people suffer. Though we should allow freedom to advocate nonsense, we also have the responsibility to live and work with the best available knowledge, and hence to counter nonsense. Serious thinkers in “religion and science” should align themselves with fair-minded sceptics, who challenge the exploitation of human gullibility.

The natural sciences deliver knowledge such as that embodied in the periodic table, through a collaborative effort of scientists from many different national and cultural backgrounds. Such knowledge is well tested and confirmed, and turns out to be eminently applicable. In those cases, it is a matter of practical wisdom that we should use such knowledge as much as possible, in the domains where it has been shown to be valid. The judge of such knowledge is the scientific community; decisions are not up to outsiders who, for economic, political, cultural, social, religious, or philosophical interest would have preferred a different “science.” However, such knowledge is not the answer to metaphysical or moral questions; that would reach too far.

WHAT DOES RESPECTING SCIENCE NOT ENTAIL?

Science needs to be taken seriously. And I find panentheism conceptually an interesting position, though hard to grasp and pin down, and I have great respect for the late Arthur Peacocke. But does panentheism do particularly well with respect to science? We’ll consider how science does in four domains of potential metaphysical and religious interest: the interpretation of scientific theories and concepts; ultimate questions about existence; the foundation of universal, moral, values; and the foundation of particular, existential, values.

Multiple Interpretations of Scientific Theories and Concepts

Even if scientific theories are understood as well-established, they need not have an unambiguous philosophical interpretation. Possible interpretations of scientific theories are not determined by the theories, even though any theory constrains the range of its possible interpretations. There may be multiple interpretations of well-established theories, that is, multiple ways of describing the philosophical, human, moral, religious, or metaphysical consequences of a particular scientific theory.

It is fairly widely known that there are multiple interpretations of quantum physics; they describe *ways the world could possibly be* (Van Fraassen 1984, 171). Quantum physics is not exceptional; other theories allow for multiple interpretations too. Relativity theory can be formulated as a theory about the development of the universe through time, or as a theory

about the whole four-dimensional space-time as a “block universe” at once, just as a film can be shown as a temporal narrative or treated as a whole as a single object. Similarly, dynamic systems can be described in terms of phase space rather than as evolving in ordinary space. There are multiple ways of understanding “time,” each one consistent with current science as far as corroborated.

The concept of “emergence,” beloved by some of the panentheists as different from “reduction,” is no exception to the openness to a plurality of interpretations involved, but the clarity of meaning also suffers from the variety of cases subsumed under the category of emergence. It is itself not a single theory or theoretical scheme, such as quantum physics, but a label covering a variety of situations. In any particular instance of a relationship between scientific theories that seem to describe different levels—from thermodynamics (a gas with pressure and temperature and a cloud of particles that move around with a certain velocity and hence kinetic energy and momentum) to organic chemistry and biology, or neuroscience and consciousness—the way the levels are demarcated and the conceptual relations are envisaged may be different. When the emphasis is on new entities with properties not found previously, one might envisage such emergence as ontological. When the emphasis is on the new conceptual vocabularies, the new theories and epistemic strategies at the “higher” level relative to the lower one, one might consider it epistemic emergence. Of course, there is much more detail in discussions on emergence in philosophy of science, but here I would like to consider the meaning of emergence and its alternative, reduction, in general terms, and thus their potential significance when deciding on religious-metaphysical schemes.

As I see it, any successful attempt to correlate descriptions at two different levels of complexity could be considered an example of understanding emergence, as it clarifies how new entities arise. It could also be considered an example of reduction, as the new is correlated with the underlying or preceding processes. In that general sense, emergence and reduction can be considered two words for the same insight: the reality we live in has many remarkable opportunities, and these tend to be connected. *Reduction and emergence* are words that signal the dense web of relatedness within natural reality, as studied by the natural sciences. A reductionist description seeks to explain how Y might arise out of underlying processes X (and in that sense would be holistic by embedding Y in the larger understanding of which X is a part). Someone who values emergence might say that Y has emerged out of X, in a particular context. A major difference seems to be that the one values the “upper level” Y more, as more complex, whereas the reductionist might consider the “lower level” X more fundamental. Such a difference in appreciation is a matter of interpretation; as far as the science is concerned, reduction and emergence

might be understood as two sides of the same coin (Drees 2013; McMullin 2013).

Interpretation is, of course, even more the case when emergence is interpreted religiously, in terms of “divine immanence,” as a panentheist might opt to do. A theist could understand emergence as a possibility of the laws of nature, given by God. And a pantheist could treat the web of relations of emergence and reduction as a significant possibility of nature, which thereby shows its rich potentiality, and realizes some its potential. The divine may be seen nowhere or everywhere, but when such religious language is used it is a religious or metaphysical interpretation *given to* scientific theories; the theories themselves do not involve such a vocabulary or meaning.

Ultimate Questions

Why is there something rather than nothing? Why is the world as it is? These questions are unanswerable within the sciences, because a scientific explanation does not begin with “nothing” it assumes laws and existence. These laws can be questioned, too, but that pushes the horizon further. We build our knowledge upon pillars driven deeper and deeper, but not on pillars that rest on a self-evident and self-supporting layer of rocks.

Theism seems to have the advantage on this issue, as it offers an answer: the answer to ultimate questions is “God,” the Creator of it all. However, despite a long history of “cosmological” arguments for the existence of God, none seem to have been decisive. Furthermore, giving “God” as the answer raises a further question: Why is there such a God? The traditional philosophical response, that God is His own cause (*causa sui*) does not really convince as an answer; God, and God’s nature as the sole being that has necessary existence, are assumptions.

A different orientation might be preferred by a pantheist or panentheist: there is not a “being” who created this world, but a “Ground of Being” (Drees 2016). An analogy might be with the role of axioms for a mathematical system: they are part of the system, not prior in time but fundamental to the system as a whole. Such a “ground,” like the axioms, may be an intrinsic part of the system, and that suits the pantheist. But from a point of view outside the system, they are contingent; other axioms could have been picked, and with other axioms a different reality.

If there is no necessary connection between the scientific understanding and a particular religious or metaphysical scheme that would provide an “ultimate explanation” of why the world exists and is as it is, science does not make a difference when we seek a basis to choose between theism, pantheism, and panentheism, as long as these respect the regularities discovered by science. For the theist, this requires a “naturalistic theism” without miracles that intervene in natural processes (but such positions do

exist; see, for a more extensive discussion on religious naturalism alongside naturalistic theism, Drees 2006, 116f.). Perhaps we do best to acknowledge that we do not have access to the ultimate explanation; our models will be inadequate—a motive with ancestry in ‘negative’ theology, because God is always greater than we are our imaginations. “The” answer might remain a mystery. In this vein, the physicist Charles Misner (1977, 95) wrote: “To say that God created the Universe does not explain either God or the universe, but it keeps our consciousness alive to mysteries of awesome majesty that we might otherwise ignore.”

In its avoidance of a positive answer, this statement might be sympathetic to a panentheist, but in the end the claim is epistemic (agnostic) rather than advocacy of any particular metaphysical position.

Universal Values

Moral conclusions need a moral premise, as well as scientific knowledge about possible causes and consequences. Any reasoning that moves from merely a description to a prescription suffers from the naturalistic fallacy. Calling something “purely natural” may work in advertising, but is not a valid argument. Thus, science by itself does not deliver moral values.

Theism might claim to provide an argument for universal values, though historical, particular forms of theism have fallen short of that ideal. In order to count as a religious position, panentheism has to incorporate a value dimension as well. For many adherents who emphasize emergence, it has one: valuing complexity over simplicity, the temporal over the timeless, dynamics over static situations, and mind over the matter out of which it emerged. None of this is itself a consequence of science, but neither is it inconsistent with science. However, it may be difficult to make a case for universality if values are related to contingent outcomes of natural processes.

What We Care About: Particular Meaning

There is a different type of values, more particular in kind. Morally speaking, I ought to value all humans equally. But in a personal sense, some people are more important to me than others. And some pursuits are closer to my own heart than others. Answering personal questions about one’s loves and sources of meaning is not the business of science either. We care about our loves, and we engage in projects that provide existential meaning—and those are particular loves, rather than the universalizability that is assumed in moral discourse (Frankfurt 1981; Wolf 2010; Van Stee 2017) as well as in science.

CONCLUDING CONSIDERATIONS: AN AGNOSTIC STANCE AND
INTRA-RELIGIOUS ARGUMENTS

There seems to be no way to prefer panentheism over any of the other grand metaphysical schemes, on the basis of science. The relation might be in the opposite direction, from panentheism to science. As we have seen in the remarks of Peacocke and of Clayton, some panentheists are appreciative of science. A panentheistic interpretation of science provides a vocabulary to speak about processes in reality in value-laden terms. This direction, from a theological or metaphysical view to an interpretation of science, seems to characterize the contribution by Jan-Olav Henriksen (2017) in this issue. In his case, the point of departure is a Christian theology that speaks of the Trinity and of sacraments, but understands these notions in a way that they may be related to the world as described and understood by contemporary science. Henriksen is quite explicit on the movement from theology to panentheism: "The reasons contemporary Christian theology has for considering panentheism a viable option can, therefore, be articulated as related to theological concerns on several different levels" (Henriksen 2017, p.1083).

Such a panentheistic interpretation of science may be positive for science, because it may invite its adherents to appreciate and study those phenomena—such as the way complexity emerges from more simple structures. It might also be positive for the underlying religious and metaphysical preference, because that position thereby aligns itself with science, and apparently appropriates some of the prestige of science.

Not all forms of panentheism may be equally open to the practice and language of science. Panentheism might also align itself with a spirituality that opposes "reduction," and thus dislike the study of underlying processes like studying the brain in relation to consciousness, or studying the chemistry of cells in relation to life. A panentheist may see the divine in a beautiful sunset, but for a romantic panentheistic it may be harder to acknowledge that this is the outcome of the breaking of light in the atmosphere. Romantic movements have appreciated nature, but they have not always been conducive to a successful scientific study of natural processes.

Hence, some versions of religious panentheism may employ a discourse and understanding of reality that aligns less with science, while other forms of panentheism might be more easily articulated in ways that are consistent with science. One could call those versions that do "naturalistic panentheisms." They can co-exist well with science, because they seem to respect the constraints of science as practice and as body of knowledge, and involve the practice and conceptuality of science. Disagreement on engagement with science might arise among panentheists. Aligning oneself with science may thus serve well in intra-religious (or intra-religious-metaphysical) discussions, as it appropriates some of the authority of science.

However, given that the strength of science is primarily pragmatic and heuristic, offering ideas about the way the world could possibly be, but not delivering a decisive argument for a single metaphysical scheme, panentheism, as a broad religious-metaphysical view, is not better off in relation to science than theism or pantheism. Naturalistic variants of theism might be similarly able to co-exist with science, exploiting the room provided by the underdetermination of worldviews by science for a different metaphysical-religious scheme. There too, the main feature of the engagement with science, the so-called “religion and science dialogue,” is that by claiming to have science on one’s side, one particular interpretation of the major metaphysical and religious position assumed, is considered preferable over other interpretations. Science can be used in intra-religious disagreement, more than in disagreement between religions or metaphysics (Drees 2010; Olson 2011, 24–29).

Science provides constraints, but cannot determine our choice for a particular worldview or metaphysics. A preferred interpretation of a particular worldview of religious vision will have to be argued with philosophical arguments and moral and existential preferences, though intelligibility and consistency with science are relevant too. A formulation that appeals to me, because it combines an agnostic orientation in metaphysics with gratitude for the potential of natural reality, has been offered by the novelist John Fowles in his book of aphorisms *The Aristos* (1980, 27):

The ubiquitous absence of “God” in ordinary life is this sense of non-existing, of mystery, of incalculable potentiality; this eternal doubt that hovers between the thing in itself and our perception of it; this dimension in and by which all other dimensions exist. The white paper that contains a drawing; the space that contains a building; the silence that contains a sonata; the passage of time that prevents a sensation or object continuing forever; all these are “God.”

ACKNOWLEDGMENTS

This article is based on a presentation at the International Conference on “The Many Faces of Panentheism: Reinforcing the Dialogue between Science and Religion,” held at the Collegium Helveticum, Zurich, 3–4 June 2016. I am grateful to Harald Atmanspacher and Hartmut von Sass for the invitation to present at that event, and for their helpful feedback on an earlier version of this article.

REFERENCES

- Bishop, John, and Ken Perszyk. 2016. “Concepts of God and Problems of Evil.” In *Alternative Concepts of God: Essays on the Metaphysics of the Divine*, edited by Andrei A. Buckareff and Yujin Nagasawa, 106–27. Oxford, UK: Oxford University Press.
- Buckareff, Andrei A., and Yujin Nagasawa, eds. 2016. *Alternative Concepts of God: Essays on the Metaphysics of the Divine*. Oxford, UK: Oxford University Press.

- Burhoe, Ralph W. 1975. "The Human Prospect and the 'Lord of History'." *Zygon: Journal of Religion and Science* 10:299–375.
- Clayton, Philip. 2004. "Panentheism in Metaphysical and Scientific Perspective." In *In Whom We Live and Move and Have Our Being: Panentheistic Reflections on God's Presence in a Scientific World*, edited by Philip Clayton and Arthur Peacocke, 73–91. Grand Rapids, MI: William B. Eerdmans.
- Clayton, Philip, and Arthur Peacocke, eds. 2004. *In Whom We Live and Move and Have Our Being: Panentheistic Reflections on God's Presence in a Scientific World*. Grand Rapids, MI: William B. Eerdmans.
- Crosby, Donald A. 2015. *Nature as Sacred Ground: A Metaphysics for Religious Naturalism*. Albany: State University of New York Press.
- Drees, Willem B. 2006. "Religious Naturalism and Science." In *The Oxford Handbook of Religion and Science*, edited by Philip Clayton and Zachary Simpson, 108–23. Oxford, UK: Oxford University Press.
- . 2010. *Religion and Science in Context: A Guide to the Debates*. London, UK: Routledge.
- . 2013. "Emergence and Reduction: The Same Coin?" *Zygon: Journal of Religion and Science* 48:247–50.
- . 2016. "The Divine as Ground of Existence and of Transcendental Values: An Exploration." In *Alternative Concepts of God: Essays on the Metaphysics of the Divine*, edited by Andrei A. Buckareff and Yujin Nagasawa, 195–212. Oxford, UK: Oxford University Press.
- Fowles, John. 1980. *The Aristos*. Revised ed. Falmouth, UK: Triad/ Granada.
- Frankfurt, Harry. 1981. *The Importance of What We Care About: Philosophical Essays*. Cambridge, UK: Cambridge University Press.
- Geertz, Clifford. 1966. "Religion as a Cultural System." In *Anthropological Approaches to the Study of Religion*, edited by Michael Banton, 1–46. London: Tavistock. Reprinted in Clifford Geertz, *The Interpretation of Cultures*. New York, NY: Basic Books, 1973.
- Goodenough, Ursula. 1998. *The Sacred Depths of Nature*. New York, NY: Oxford University Press.
- Henriksen, Jan-Olav. 2017. "The Experience of God and the World: Christianity's Reasons for Considering Panentheism a Viable Option." *Zygon: Journal of Religion and Science* 52(4):1080–1097.
- Hubbeling, H. G. 1987. *Principles of the Philosophy of Religion*. Assen, The Netherlands: Van Gorcum.
- Kitcher, Philip. 1993. *The Advancement of Science: Science without Legend, Objectivity without Illusions*. New York, NY: Oxford University Press.
- Kuhn, Thomas. 1962. *The Structure of Scientific Revolutions*. Chicago, IL: University of Chicago Press.
- McMullin, Ernan. 2013. "Biology and the Theology of the Human." *Zygon: Journal of Religion and Science* 48:305–28. Originally published in *Controlling Our Destinies: Historical, Philosophical, Ethical, and Theological Perspectives on the Human Genome Project*, edited by Phillip R. Sloan, 367–93. Notre Dame, IN: University of Notre Dame Press, 2000.
- Misner, Charles W. 1977. "Cosmology and Theology." In *Cosmology, History, and Theology*, edited by Wolfgang Yourgrau and Allen D. Breck, 75–100. New York, NY: Plenum Press.
- Nagasawa, Yujin. 2016. "Modal Panentheism." In *Alternative Concepts of God: Essays on the Metaphysics of the Divine*, edited by Andrei A. Buckareff and Yujin Nagasawa, 91–105. Oxford, UK: Oxford University Press.
- Olson, Richard. 2011. "A Dynamic Model for 'Science and Religion': Interacting Subcultures." *Zygon: Journal of Religion and Science* 46:65–83.
- Oreskes, Naomi, and Erik M. Conway. 2010. *Merchants of Doubt: How a Handful of Scientists Obscured the Truth on Issues from Tobacco Smoke to Global Warming*. New York, NY: Bloomsbury.
- Peacocke, Arthur. 2004a. "Introduction 'In Whom We Live and Move and Have Our Being?'" In *In Whom We Live and Move and Have Our Being: Panentheistic Reflections on God's Presence in a Scientific World*, edited by Philip Clayton and Arthur Peacocke, xviii–xxii. Grand Rapids, MI: William B. Eerdmans.

- . 2004b. "Articulating God's Presence in and to the World Unveiled by the Sciences." In *In Whom We Live and Move and Have Our Being: Panentheistic Reflections on God's Presence in a Scientific World*, edited by Philip Clayton and Arthur Peacocke, 137–54. Grand Rapids, MI: William B. Eerdmans.
- Stone, Jerome A. 2009. *Religious Naturalism Today: The Rebirth of a Forgotten Alternative*. Albany: State University of New York Press.
- Swinburne, Richard. 1993. *The Coherence of Theism*. Revised edition. Oxford, UK: Oxford University Press.
- Van Fraassen, Bas C. 1984. "The Problem of Indistinguishable Particles." In *Science and Reality: Recent Work in the Philosophy of Science: Essays in Honor of Ernan McMullin*, edited by James T. Cushing, C. F. Delaney, and Gary M. Gutting, 153–72. Notre Dame, IN: University of Notre Dame Press.
- Van Stee, Annemarie. 2017. *Understanding Existential Self-Understanding: Philosophy Meets Cognitive Neuroscience*. PhD thesis, Leiden University, Leiden, The Netherlands.
- Verlinde, Erik P. 2016. "Emergent Gravity and the Dark Universe." Preprint at <https://arxiv.org/abs/1611.02269v2>, accessed November 16, 2016.
- Wolf, Susan. 2010. *Meaning in Life and Why It Matters*. Princeton, NJ: Princeton University Press.